**Non-technical Abstract:**

Adenocarcinoma is the name for a type of cancer, which may occur in any of several places in the body. Most adenocarcinomas of the colon and rectum, as well as many of the breast, lung, pancreas and others, have an abnormally large amount of a protein called CEA. This is known as "overexpression" of CEA. Therefore, the development of a treatment vaccine that could successfully stimulate the body's own defenses (immune system) to specifically attack these cancer cells which over-express CEA, could potentially help treat many people. Recently, two vaccines of this type, vaccinia-CEA and ALVAC-CEA were tested in what is known as a Phase I Clinical Trial, a study conducted with cancer patients to evaluate new treatments for cancer. The study used a virus called vaccinia (small pox vaccine) and a virus called fowlpox (bird virus) to create these CEA vaccines, which when given to patients by injection, are able to carry the CEA gene into the body. These vaccines are designed to teach the immune system to seek-out and destroy any of the body's cells that over-express CEA; namely, the cancer cells. The results of the study showed that in most of the patients treated, these vaccines were able to cause an increase in the number of an important type of immune system cell (T-cells), which had learned to attack CEA. The results also showed that repeat injections of the fowlpox-CEA vaccine helped to make this immune response even stronger with each additional injection. Both vaccines were safely used in these patients with advanced cancer. However, there was no actual improvement of their cancer with these forms of treatment. We know that in order to have a successful immune response against a target such as CEA, the body must strongly activate its T cells. We also now know of three molecules, known as "co-stimulatory molecules", that are capable of increasing such activation of these T cells. Therefore, building upon the knowledge of the first CEA vaccines, two new CEA vaccines using vaccinia and fowlpox have been created to also include genes for these three co-stimulatory molecules. When tested in animals with cancers that over-express CEA, these vaccines appeared to be better than the original vaccines tested. Specifically, they caused improvement in the medical condition of several of the animals and also showed actual improvement of the cancer in a few of the animals. In addition, some early test results show that the use of a slightly different form of the CEA gene, the form used in these new vaccines, caused much greater activation of the immune system than did the form used in the first CEA vaccines. When these new vaccines, named vaccinia-CEA(6D)-TRICOM and fowlpox-CEA(6D)-TRICOM, were studied within a Phase I trial for humans, they were associated with only minimal side effects and were also associated with at least stabilization of disease for some patients . It is thought that if Docetaxel chemotherapy were added to this vaccine regimen, as in this pilot study, an association with a better immune response against the cancer cells may be seen.